

*Ephemeris of the Satellites of Uranus, 1894. By A. Marth.*

Greenwich Noon. 1894.	<i>Ariel.</i>					<i>Umbriel.</i>				
	P	$a_1$	$b_1$	$u_1-U$	Diff.	$a_2$	$b_2$	$u_2-U$	Diff.	
	°	"	"	°	°	"	"	°	°	
Mar. 2	272°36	14°56	+12°37	201°54	1428°40	20°29	+17°24	52°14	868°69	
12	272°47	14°68	12°45	189°94	°34	20°45	17°35	200°83	°63	
22	272°63	14°78	12°51	178°28	°30	20°60	17°43	349°46	°60	
Apr. 1	272°83	14°87	12°54	166°58	°26	20°72	17°47	138°06	°57	
11	273°06	14°94	12°55	154°84	°22	20°81	17°49	286°63	°54	
21	273°31	14°98	12°53	143°06	°19	20°87	17°46	75°17	°52	
May 1	273°57	15°00	+12°49	131°25	°17	20°90	+17°40	223°69	°51	
11	273°83	15°00	12°43	119°42	°16	20°89	17°31	12°20	°50	
21	274°08	14°97	12°34	107°58	°15	20°85	17°19	160°70	°50	
31	274°30	14°91	12°24	95°73	°15	20°77	17°06	309°20	°51	
June 10	274°48	14°83	12°13	83°88	°16	20°67	16°90	97°71	°53	
20	274°63	14°74	12°02	72°04	1428°18	20°54	16°74	246°24	868°55	
30	274°75	14°63	+11°90	60°22		20°38	+16°58	34°79		
<i>Titania.</i>					<i>Oberon.</i>					
	$a_s$	$b_s$	$u_s-U$	Diff.	$a_s$	$b_s$	$u_s-U$	U	B	
	"	"	°	°	"	"	°	°	°	
Mar. 2	33°28	+28°27	244°83	413°48	44°50	+37°81	302°16	353°34	+58°16	
12	33°55	28°46	298°31	°44	44°86	38°05	209°50	353°42	58°01	
22	33°78	28°59	351°75	°40	45°18	38°23	116°80	353°53	57°79	
Apr. 1	33°98	28°66	45°15	°37	45°45	38°33	24°07	353°67	57°50	
11	34°14	28°68	98°52	°35	45°65	38°35	291°32	353°83	57°16	
21	34°24	28°64	151°87	°33	45°79	38°30	198°55	354°01	56°78	
May 1	34°28	+28°54	205°20	°33	45°85	+38°17	105°76	354°19	+56°37	
11	34°27	28°40	258°53	°34	45°83	37°97	12°98	354°37	55°96	
21	34°20	28°20	311°87	°35	45°73	37°72	280°20	354°53	55°56	
31	34°07	27°98	5°22	°36	45°56	37°41	187°43	354°68	55°19	
June 10	33°90	27°73	58°58	°39	45°33	37°07	94°68	354°81	54°87	
20	33°68	27°46	111°97	413°41	45°05	36°72	1°96	354°91	54°61	
30	33°43	+27°19	165°38		44°71	+36°36	269°26	354°99	+54°41	

The values of P,  $a$ ,  $b$ , and  $u-U$  being interpolated for the times for which the apparent positions of the satellites are required, the position-angles  $p$  and distances  $s$  from the centre of the planet are found by means of the formulæ :

$$s \sin (p-P) = a \sin (u-U)$$

$$s \cos (p-P) = b \cos (u-U)$$

Since the Earth passed through the planes of the orbits in 1882, the only observations of the inner satellites which have come to my knowledge are the few measures, published in vol. iv. pp. 340, 341 of the *Bulletin Astronomique*, made by M. Perrotin in 1887, at a time when the apparent orbits were still too narrow to allow the satellites to be observed except not far from their greatest elongations or digressions. The apparent orbits are now sufficiently opened to allow the satellites to be seen in any part, and it is high time that good measures should be secured, before *Uranus* gets too far south for exact observing in northern latitudes. Cannot observers with powerful instruments be induced to contribute at least some good position-angles of the satellites during the present opposition?

A sidereal revolution of *Uranus* being performed in approximately 84 sidereal years, the apparent positions of the planet with regard to fixed stars recur very nearly after that period, so that the apparent path of *Uranus* during the present apparition differs only slightly from what it was in 1810. In the Berlin *Jahrbuch* for 1814 Bode represents in fig. 2 of the plate the path of the planet from 1810 April 26 to May 5, when it was near the stars 8 and 9 *a Libræ* (the 1 *a* and 2 *a Libræ* of Maskelyne's fundamental catalogue). On p. 167 Bode mentions that on April 29 he compared *Uranus* with 1 *a Libræ*, and found it just as bright, only somewhat paler.

*Note on the Transit of Mercury over the Sun's Disc, which takes place for Venus on 1894 March 21, and on the Transits of Venus and Mercury, which occur for Saturn's System on the same day.*  
By A. Marth.

After an interval of thirty years, during which no transit of *Mercury* across the Sun has occurred for *Venus*, the first of a new group of transits takes place on March 21. The centre of *Mercury's* disc (of  $20''.3$  apparent diameter) will enter upon the Sun's disc (of  $1333''.7$  semi-diameter) for the centre of *Venus* at  $10^h 48^m$  G. M. T. in pos. angle  $21^\circ$  (reckoned from the circle of ecliptical latitude), and will leave it at  $14^h 30^m$  in pos.  $319^\circ$ , the difference of the parallaxes being  $16''.4$ , which data will be sufficient for a graphical representation.

Some hours before this transit both planets will have crossed the Sun's disc for *Saturn's* system, *Venus* entering as a spot of  $2''.0$  diameter for *Saturn's* centre on March 20 at  $18^h 50^m$  G. M. T. in pos. angle  $34^\circ$ , and leaving it on March 21 at  $0^h 56^m$  in pos.  $322^\circ$ ; while *Mercury*, a tiny spot of only  $0''.7$  diameter, enters at  $5^h 9^m$  in pos.  $11^\circ$ , and leaves at  $7^h 41^m$  in pos.  $337^\circ$ , the apparent semi-diameter of the Sun's disc being  $99''.2$ .

The following is a list of the transits of the planets since 1830: